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May 11, 2007 (Date of Signature)**Customer Number 020991****Patent  
PD-200108****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In Re Application of:

Ying Feria

Serial No. 09/661,967

Group Art Unit: 2617

Filed: 09/14/2000

Examiner: Ly, Nghi H.

For: STRATOSPHERIC-BASED COMMUNICATION SYSTEM HAVING  
INTERFERENCE REJECTION CANCELLATION**BRIEF ON APPEAL**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted pursuant to the Notice of Appeal filed simultaneously herewith, May 11, 2007, for the above-identified application.

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**I. Real Party in Interest**

The real party in interest in this matter is The DIRECTV Group, Inc of El Segundo, California, which is 34 percent owned by Fox Entertainment Group, which is approximately 82 percent owned by The News Corporation, Limited.

**II. Related Appeals and Interferences**

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

**III. Status of the Claims**

Claims 1-26 stand rejected in the Final Office Action. Claims 1-26 are appealed herein.

**IV. Status of Amendments**

There have been no Amendments filed after the final rejection.

**V. Summary of Claimed Subject Matter**

Claim 1 is directed to a communication system (10) that is generally illustrated in Figure 1 and is described on pages 5-7. The communication system (10) (page 5, line 14) includes a stratospheric platform (18) (page 6, line 12 to page 7, line 6) having a payload controller and a phased array antenna (page 8, line 9) having a plurality of elements for generating a first beam and a second beam. A gateway station (20) in communication with said stratospheric platform (18) receives a first signal having a first beam having interference from the second beam therein and a second signal having a second beam having interference from the first beam therein. As is best shown in Figure 3 and the corresponding text on pages 9-10, the gateway station (20) includes a first subtracting block (74) for subtracting the second signal from the first signal to obtain the first beam and a second subtracting block (76) for subtracting the first signal from the second signal to obtain a second beam. One point to note is that only two signals are received to form two beams (page 9, line 20 to page 10, line 18).

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Claim 2 is dependent upon Claim 1 and recites that the gateway station weights the second signal with the first weight prior to subtracting the second signal from the first signal, which is illustrated in Figure 3 (page 10, lines 9-11).

Claim 3 depends upon Claim 1 and recites that the gateway station weights the first signal with the second weight prior to subtracting the second signal from the first signal as is shown in Figure 3 (page 10, lines 1-5).

Claim 4 depends from Claim 2 and recites that the first weight is a function of user position files (page 10, lines 15-16).

Claim 5 depends from Claim 1 and recites that the payload controller of Figure 1 comprises a demultiplexer 54 for receiving control signals (page 8, line 22 to page 9, line 6).

Claim 6 is dependent from Claim 5 and recites that the demultiplexer generates a plurality of element control signals as is best shown in Figure 2 (page 8, line 22 to page 9, line 6).

Claim 7 is dependent from Claim 6 and recites that the element control signals are coupled to an RF feed and the RF feed is coupled to the plurality of elements of the phased array antenna. The RF feeds are generally illustrated as 56 in Figure 2 (page 9, lines 3-6).

Claim 8 is dependent upon Claim 1 and recites that the gateway station comprises a beam generator for generating beam signals. The beam generator is generally illustrated as 42 of Figure 2 (page 8, lines 6-18).

Claim 9 depends from Claim 1 and recites that the gateway station further comprises a multiplexer/demultiplexer. The multiplexer/demultiplexer is illustrated as 44 of Figure 2 (page 8, lines 20-23).

Claim 10 depends from Claim 9 and recites that the multiplexer/demultiplexer 44 comprises a code division multiplexer (page 8, lines 20-23).

Claim 11 is dependent upon Claim 1 and recites that the gateway station is coupled to a terrestrial network 22 illustrated in Figures 1 and 2 (page 7, lines 13-16).

Claim 12 is dependent upon Claim 11 and recites that the terrestrial network comprises the Internet (page 7, lines 13-16).

Claim 13 depends from Claim 11 and recites that the terrestrial network comprises a public service telephone network (page 7, lines 13-16).

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Claim 14 is an independent claim directed to a method of controlling a communication system 10 having a stratospheric platform 18 (page 6, line 12 to page 7, line 6). Figure 3 generally illustrates the method for performing the method. Claim 14 recites receiving a first signal having first beam interference from a second beam therein at a gateway station. Claim 14 also recites receiving a second signal having a second beam having interference from the first beam therein at the gateway station. Claim 14 further recites the step of subtracting the second signal from the first signal to obtain the first beam and subtracting the first signal from the second signal to obtain the second beam (page 9, line 20 to page 10, line 18).

Claim 15 depends from Claim 14 and recites that prior to the steps of receiving, generating the first beam and the second beam using the payload controller and the phase array antenna having a plurality of elements therefore (page 8, line 9). Claim 15 further recites that prior to the step of subtracting said second signal from the first signal, weighting the second signal with the first weight and prior to the step of subtracting the first signal from the second signal weighting the first signal with the second weight (page 10, lines 9-11).

Claim 16 depends from Claim 15 and recites performing the step of subtracting the second signal from the first signal to obtain the first beam in a first subtracting block in the gateway station and performing the step of subtracting the first signal from the second signal to obtain the second beam in a second subtracting block in the gateway station (page 10, lines 9-16).

Claim 17 (page 10, lines 1-5) depends from Claim 15 and recites that the first weight and the second weight are a function of user position files (page 10, lines 15-16).

Claim 18 is another independent claim and recites the steps of receiving the first signal having a first beam having interference from a second beam therein, receiving a second signal from the second beam having interference from the first beam therein at the gateway station, weighting the first signal with the first weight to provide a weighted first signal, weighting the second signal with the second weight to provide a weighted second signal, subtracting the second weighted signal from the first signal to obtain the first beam and subtracting the weighted signal from the second signal to obtain the second beam (page 9, line 20 to page 10, line 18).

Claim 19 is dependent upon Claim 18 and recites the first weight and the second weight are a function of user position files (page 10, lines 15-16).

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Claim 20 is an independent claim and recites a method of canceling interference at the gateway station that includes receiving a plurality of signals from each of the plurality of users. The at least one of the plurality of signals has interference therein from at least one other of the plurality of signals. Claim 20 further recites determining an amount of interference from the user position file and canceling the interference in at least one of the plurality of signals by subtracting at least one other of the plurality of signals (page 9, line 20 to page 10, line 18).

Claim 21 depends upon Claim 20 and recites that prior to the step of canceling the at least one other of the plurality of signals is weighted (page 10, lines 1-5).

Claim 22 depends upon Claim 21 and recites that one signal is associated with a mobile user.

Claim 23 depends from Claim 22 and recites that one of the other of the plurality of signals is associated with a mobile user 16m (page 5, lines 19-21).

Claim 24 depends from Claim 3 and recites that the second weight is a function of user position files (page 10, lines 15-16).

Claim 25 recites a communications system that includes a stratospheric platform 18 (page 6, line 12 to page 7, line 6) having a payload controller and an antenna (page 8, line 9) having a plurality of elements for generating a first beam and a second beam. The communication system also includes a gateway station 20 in communication with said stratospheric platform 18, said gateway station 20 receiving a first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein. The gateway station 20 weighs the second signal with a first weight to form a weighted second signal. The gateway station 20 also includes a first subtracting block subtracting the second weighted signal from said first signal to obtain the first beam, wherein said first weight is a function of user position files. The gateway station 20 includes a second subtracting block for subtracting the first signal from the second signal to obtain the second beam (page 9, line 20 to page 10, line 18).

Claim 26 recites a communications system that includes a stratospheric platform 18 (page 6, line 12 to page 7, line 6) having a payload controller and an antenna having a plurality of elements for generating a first beam and a second beam. The system also includes a gateway station 20 in communication with the stratospheric platform. The gateway station 20 receives a

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first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein. The gateway station 20 weighs the second signal with a first weight to form a weighted second signal. Thereafter, the gateway station 20 also includes a first subtracting block subtracting the second weighted signal from the first signal to obtain the first beam. The gateway station weighs the first signal with a second weight to form a first weighted signal. The gateway station also comprises a second subtracting block for subtracting the first weighted signal from the second signal to obtain the second beam. The first weight and the second weight being a function of user position files (page 9, line 20 to page 10, line 18).

#### VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

Whether Claims 1, 8-14, 18 and 20 are obvious under 35 U.S.C. §103(a) over *Ibanez-Meier* (6,151,308) in view of *Kavehrad* (4,577,330).

Whether Claims 2-4, 15-17, 19 and 21-26 are obvious under 35 U.S.C. §103(a) over *Ibanez-Meier* (6,151,308) in view of *Kavehrad* (4,577,330) further in view of *Baier* (6,519,477).

Whether Claims 5-7 are obvious under 35 U.S.C. §103(a) over *Ibanez-Meier* (6,151,308) in view of *Kavehrad* (4,577,330) and *Rouffet* (5,410,731).

#### VII. Argument

**The Rejection of Claims 1, 8-14 and 20 under 35 U.S.C. §103(a) over *Ibanez-Meier* (6,151,308) in view of *Kavehrad* (4,577,330)**

##### ***Claim 1***

The *Ibanez-Meier* reference teaches stratospheric platforms and satellites at various altitude levels. A user may receive signals from two different sources. The system relies on spatial diversity to prevent interference. As the *Ibanez-Meier* reference implies, when two signal sources become colinear or near colinear, interference between the signals may result in unacceptable signal degradation. As stated beginning in Col. 16, line 61, signal degradation may be remedied by ceasing to communicate over one of the links in which degradation is present or

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switching to another link. This highlights the spatial diversity aspect for resolving interference. This is a teaching away from signal subtraction. No teaching or suggestion is provided for subtracting signals as in the present invention.

The *Kavehrad* reference is cited for teaching a first subtracting block and a second subtracting block. The *Kavehrad* reference is not directed to a receiver in a gateway station. A suggested use of the *Kavehrad* system is line-of-sight terrestrial radio applications (Col. 2, line 68). Appellants, therefore, respectfully request the Board to reverse the Examiner's position with respect to this rejection as well since the *Kavehrad* reference does not teach a gateway station that is in communication with a stratospheric platform. The *Kavehrad* reference also does not teach that the gateway station receives a first signal having a first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein wherein the gateway station has a first subtracting block and a second subtracting block for subtracting the second signal from the first signal and the first signal from the second signal, respectively.

In response to the above arguments, the final Office Action states that the *Ibanez-Meier* reference teaches a gateway station in communication with the stratospheric platform and not the *Kavehrad* reference. The Examiner states that the combination of the *Ibanez-Meier* and *Kavehrad* references teaches the claimed invention. The Examiner then states "the combination of the *Ibanez-Meier* or *Kavehrad* references does not specifically disclose the gateway station comprising a first subtracting block in a second subtracting block. However, *Kavehrad* differs from the claims in that the above operations are done in the satellite ... not in the gateway station as recited in the claim." Appellants can find no teaching or suggestion for the Examiner's statement that the *Kavehrad* reference teaches this specific use. The Examiner points to column 1, lines 20-21, for teaching a satellite system. However, this passage is in the Background and merely recites that the bandwidth efficiency of a terrestrial or satellite radio may be doubled using frequency reuse via orthogonally polarized channels. Appellants submit that the suggested use of the *Kavehrad* reference is line-of-site terrestrial radio applications as stated in the last line of column 2. Even if the *Kavehrad* reference is suitable for satellite operations, no teaching or suggestion is set forth for implementing such a system in a gateway station as set forth in the claims of the present application. This was the purpose of the Appellants' remarks that were

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commented on by the Examiner on page 2 of the final Office Action. The *Ibanez-Meier* reference merely teaches a stratospheric platform and satellite system. Neither reference contains a teaching or suggestion for making the combination. The above-stated differences attack the Examiner's motivation for making the combination, not for individually attacking the references.

Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 1.

***Claim 8***

Claim 8 recites that the gateway station comprises a beam generator for generating beam signals. The Examiner points to device interfaces in column 6, lines 45-41 (sic). The device interfaces as in the platform 200 not the gateway. Claim 8 recites the beam generator in the gateway. Also, the beam generator in combination with the elements of Claim 1 are not taught or suggested in the combination of references. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 8.

***Claim 9***

Claim 9 recites that the gateway station comprises a multiplexer/demultiplexer. The Examiner points to column 12, lines 10-21 and column 14, lines 25-28 for multiplexing. However, when reading the sections, it is clear that the communications platform is described as multiplexing signals not the gateway. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 9 as well.

***Claim 10***

Claim 10 depends from Claim 9 and recites that the multiplexer/demultiplexer comprises a code division multiplexer/demultiplexer. The Examiner cites the same passages for claim 10 as he did for claim 9. As mentioned above, the communications platform multiplexes signals and not the gateway. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to this claim as well.

***Claim 11***

Claim 11 recites that the gateway station is coupled to a terrestrial network. The Examiner points to column 8, lines 49-56 for teaching that the gateway is coupled to the terrestrial network. However, this particular passage refers to the communication platform



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coupled to a terrestrial network and not the gateway coupled to the terrestrial network. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to this claim as well.

***Claim 12***

Claim 12 depends from Claim 11 and recites that the terrestrial network comprises an Internet. The Examiner points to column 14, line 50 for the Internet. Although the Internet is mentioned, no teaching or suggestion is provided for coupling a gateway station to the Internet. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to this claim as well.

***Claim 13***

Claim 13 recites that the terrestrial network comprises a public service telephone network. The Examiner points to column 8, lines 49-56 of the Ibanez-Meier reference for teaching a public switch telephone network. However, there is no teaching or suggestion of a public switch telephone network in this passage. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 13 as well.

***Claim 14***

Independent claim 14 is similar to that of claim 1 in method form. Claim 14 is a method claim that recites receiving a first signal having a first beam having interference from a second beam therein at a gateway station, receiving a second signal having a second beam having interference from the first beam, subtracting the second signal from the first signal to obtain the first beam, and subtracting the first signal from the second signal to obtain the second beam. It is clear that this also refers to receiving signals and not transmitting signals as is set forth in *Ibanez-Meier*. Therefore, the *Ibanez-Meier* and *Kavehrad* references also do not teach or suggest the elements set forth in Claim 14.

***Claim 18***

Claim 18 is an independent method claim also having similar limitations to those of Claim 14. Claim 18 also recites weighting the first signal with the first weight to provide a weighted first signal and weighting the second signal with a second weight to provide a weighted second signal. Claim 18 further includes subtracting the weighted second signal from the first signal to obtain the first beam and subtracting the weighted second signal from the second signal

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to obtain the second beam. Appellants agree with the Examiner that the *Ibanez-Meier* reference does not teach weighting. The Examiner points to Figure 5, weights w1, w2, w3, and w4 of the *Baier* reference for teaching interference cancellation. Both intersymbol interference and multiple access interference is corrected for. However, no teaching or suggestion is provided for using the weights in a way set forth in Claim 18 as mentioned above. The Examiner appears to be picking and choosing elements from the various references and trying to combine them for the elements of the present claim. Appellants therefore respectfully request the Board to reverse the Examiner's position with respect to Claim 18.

#### *Claims 20*

Claim 20 is an independent claim directed to a method of canceling interference at a gateway station. Claim 20 recites, "plurality of signals" from a plurality of users. As discussed in the specification, for example on page 10, because the signals are all received at the gateway station, the amount of interference can be determined from the relative positions of the beams from the user position files within the gateway station. Based on the positions of the beams, interference levels may be determined for cancellation purposes. Thus, since the user signals all arrive at the gateway, signal processing can be very efficiently used for interference cancellation at the gateway. These aspects are neither suggested nor shown by *Ibanez-Meier* and *Kavehrad* whether they are considered singly or in combination.

It should also be noted that the specifics of the present invention are very suitable for a gateway station. The beams are the received beams from a stratospheric platform. The beams may be geographically separated, but still may contain interference from other beams. The signals when all returned to the gateway station may be used to obtain better signals without such things as a separate directional antenna. In the case of the present invention, a directional antenna at the stratospheric platform, for example, would increase the weight and thus increase the cost of the system. Therefore, modifying *Kavehrad* to form the present invention is not obvious as the Examiner suggests. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 20 as well.

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**The rejection of Claims 2-4, 15-17, 19 and 21-26 under 35 U.S.C. §103(a) over  
*Ibanez-Meler* (6,151,308) in view *Kavehrad* (4,577,330) further in view of  
*Baier* (6,519,477)**

***Claim 2***

Claim 2 is believed to be independently patentable since the combination of references does not teach weighting a second signal with the first weight prior to subtracting the second signal from the first signal. The Examiner cites the Baier reference for teaching weights. Admittedly weights are illustrated in Figure 5. However, there is no teaching or suggestion for waiting a second signal with a first weight prior to subtracting the second signal from the first signal. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 2.

***Claim 3***

Claim 3 is also believed to be independently patentable for the similar reasons set forth with respect to Claim 2 in that weighting is claimed. That is, weighting the first signal with a second weight prior to subtracting the second signal from the first signal is described. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 3.

***Claim 4***

Claim 4 is believed to be independently patentable since Claim 4 recites that the first weight is a function of user position files. The combination of references does not teach that the first weight is a function of user position files. More specifically, the Examiner points to column 8, lines 57-67 for teaching that the weight is a function of user position files. Appellants have reviewed this passage and can find no teaching or suggestion for user position files. The passage merely teaches weighting but not how the weights are formed. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 4.

***Claim 15***

Claim 15 depends from Claim 14 and is believed to be allowable for the same reasons set forth above with respect to Claims 2 and 3 since Claim 15 also recites the weighting of the signals. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 15.

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***Claim 16***

Claim 16 recites the specific recitations of performing the subtracting in a gateway station. This is not taught or suggested in the combination of references. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 16.

***Claim 17***

Claim 17 recites that the first weight and the second weight are a function of user position files. The weights were described above with respect to claim 4. This in combination with Claims 15 and 14 is not taught or suggested in the combination of references set forth by the Examiner. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 17.

***Claim 19***

Claim 19 depends from Claim 18 and recites the first weight and second weight as a function of user position files. The Examiner points to Col. 8, lines 57-67, for the weights being a function of user position files. The use of user position files is not specifically mentioned in this passage. Therefore, the recitations of Claim 19 in combination with the recitations of Claim 18 are not taught or suggested in the combination of references set forth by the Examiner. Appellants therefore respectfully request the Board to reverse the Examiner's position with respect to Claim 19 as well.

***Claim 21***

Claim 21 depends from independent Claim 20 and recites that the signals are weighted. This is similar to Claims 2 and 3 above and is believed to be allowable for the same reasons set forth therein. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 21.

***Claim 22***

Claim 22 recites that one of the signals is associated with a mobile user. Although mobile users are illustrated in the references, no teaching or suggestion is provided in the combination of references for the recitations of Claims 21 and 20. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 22.

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***Claim 23***

Claim 23 depends upon Claim 22 and recites that the other of the plurality of signals is associated with a mobile user. This also is not taught or suggested as discussed above with respect to Claim 22. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 23.

***Claim 24***

Claim 24 depends from Claim 3 and recites that the second weight is a function of user position files. The lack of a teaching of user position files is mentioned above with respect to Claims 4, 17 and 19. Appellants believe that this claim is also allowable for the same reasons with respect to those claims.

***Claim 25***

Claim 25 is an independent claim, the portions of which have been described in the above claims. Claim 25 is similar to claim 1 in reciting a stratospheric platform in a gateway station. However, claim 25 recites weighting the second signal with the first weight to form a second weighted signal and comprising a second subtraction block subtracting the second weighted signal from the first signal to obtain the first beam wherein the first weight is a function of user position files. As mentioned above with respect to claims 4, 17 and 19, user position files are not taught or suggested in any of the references. Likewise, the weighting of the signals is described in various claims such as claims 2 and 3. This is also not taught or suggested in the references as described above. Therefore, claim 25 is also believed to be allowable for the same reasons set forth above.

***Claim 26***

Claim 26 also recites a stratospheric platform and a gateway station in communication with the stratospheric platform. The first two elements are similar to that set forth in claims 1 and 25 above. Claim 26 does not recite that the first weight is a function of user position files but rather recites that the second weight is a function of user position files. As mentioned above, user position files used for determining a weight are not taught or suggested in the references. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to claim 26 as well.

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**Whether Claims 5-7 are obvious under 35 U.S.C. §103(a) over *Ibanez-Meier* (6,151,308) in view of *Kavehrad* (4,577,330) and *Rouffet* (5,410,731)**

***Claim 5***

Claim 5 is believed to be independently patentable since the payload controller comprises a demultiplexer for receiving control signals. This element in combination with that of Claim 1 is not taught or suggested in the combination of the references. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 5.

***Claim 6***

Claim 6 depends upon Claim 5 and recites that the demultiplexer generates a plurality of control signals. This in combination with the recitations of Claim 1 are not taught or suggested in the references. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 6.

***Claim 7***

Claim 7 depends from Claim 6 and recites that the element control signals are coupled to an RF feed which is coupled to elements of the phased array antenna. This in combination with the recitations of Claim 1 are not taught or suggested in the references. Therefore, Appellants respectfully request the Board to reverse the Examiner's position with respect to Claim 7.

**VIII. Claims Appendix**

A copy of each of the claims involved in this appeal, namely Claims 1-26 is attached as a Claims Appendix.

**IX. Evidence Appendix**

None.

**X. Related Proceedings Appendix**

None.

**XI. Conclusion**

For the foregoing reasons, Appellants respectfully request that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to Deposit Account 50-0383.

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Respectfully submitted,

Dated: May 11, 2007

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**CLAIMS APPENDIX**

1. A communications system comprising:

a stratospheric platform having a payload controller and a phased array antenna having a plurality of elements for generating a first beam and a second beam;

a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein,

said gateway station comprising a first subtracting block for subtracting said second signal from said first signal to obtain the first beam;

said gateway station comprising a second subtracting block for subtracting said first signal from said second signal to obtain the second beam.

2. A communications system as recited in claim 1 wherein said gateway station weights said second signal with a first weight prior to subtracting said second signal from said first signal.

3. A communications system as recited in claim 1 wherein said gateway station weights said first signal with a second weight prior to subtracting said second signal from said first signal.

4. A communications system as recited in claim 1 wherein said first weight is a function of user position files.

5. A communications system as recited in claim 1, wherein the payload controller comprises a demultiplexer for receiving control signals.

6. A communications system as recited in claim 5, wherein the demultiplexer generates a plurality of element control signals.



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7. A communications system as recited in claim 6, wherein the element control signals are coupled to an RF feed, and the RF feed is coupled to said plurality of elements of said phased array antenna.

8. A communications system as recited in claim 1, wherein the gateway station comprises a beam generator for generating beam signals.

9. A communications system as recited in claim 1, wherein said gateway station further comprises a multiplexer/demultiplexer.

10. A communications system as recited in claim 9, wherein said multiplexer/demultiplexer comprises a code division multiplexer/demultiplexer.

11. A communications system as recited in claim 1, wherein said gateway station is coupled to a terrestrial network.

12. A system as recited in claim 11, wherein said terrestrial network comprises an Internet.

13. A system as recited in claim 11, wherein the terrestrial network comprises a public service telephone network.

14. A method of controlling a communications system having a stratospheric platform, said method comprising the steps of:

receiving a first signal having a first beam having interference from a second beam therein at a gateway station;

receiving a second signal having a second beam having interference from the first beam therein at the gateway station,

subtracting said second signal from said first signal to obtain the first beam; and

subtracting said first signal from said second signal to obtain the second beam.

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15. A method as recited in claim 14, further comprising, prior to the steps of receiving, generating the first beam and the second beam using a payload controller and a phased array antenna having a plurality of elements therefore, and wherein prior to the step of subtracting said second signal from the first signal; weighting the second signal with a first weight, and prior to the step of subtracting said first signal from said second signal, weighting the first signal with a second weight.

16. A method as recited in claim 15, further comprising:

performing said step of subtracting said second signal from said first signal to obtain the first beam in a first subtracting block in the gateway station; and

performing said step of subtracting said first signal from said second signal to obtain the second beam in a second subtracting block in the gateway station.

17. A method as recited in claim 15 wherein said first weight and said second weight are a function of user position files.

18. A method of controlling a communications system having a stratospheric platform, said method comprising the steps of:

receiving a first signal having a first beam having interference from a second beam therein at a gateway station;

receiving a second signal having the second beam having interference from the first beam therein at the gateway station,

weighting said first signal with a first weight to provide a weighted first signal;

weighting said second signal with a second weight to provide a weighted second signal;

subtracting said weighted second signal from said first signal to obtain the first beam; and

subtracting said weighted second signal from said second signal to obtain the second beam.

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19. A method as recited in claim 18 wherein said first weight and said second weight are a function of user position files.

20. In a communication system having a gateway station for processing signals to and from a plurality of users, a method of canceling interference at the gateway station, comprising:  
receiving a plurality of signals, each from one of the plurality of users, at least one of said plurality of signals having interference therein from at least one other of said plurality of signals;  
determining an amount of interference from user position files;  
canceling the interference in said at least one of said plurality of signals by subtracting said at least one other of said plurality of signals.

21. A method as recited in claim 20, wherein, prior to the step of canceling, said at least one other of said plurality of signals is weighted.

22. A method as recited in claim 21, wherein said at least one signal is associated with a mobile user.

23. A method as recited in claim 22, wherein said at least one other of said plurality of signals is associated with a mobile user.

24. A communications system as recited in claim 23, wherein said second weight is a function of user position files.

25. A communications system comprising:  
a stratospheric platform having a payload controller and an antenna having a plurality of elements for generating a first beam and a second beam;  
a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein,

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said gateway station weighing said second signal with a first weight to form a weighted second signal, and thereafter, said gateway station comprising a first subtracting block subtracting said second weighted signal from said first signal to obtain the first beam, wherein said first weight is a function of user position files;

said gateway station comprising a second subtracting block for subtracting said first signal from said second signal to obtain the second beam.

26. A communications system comprising:

a stratospheric platform having a payload controller and an antenna having a plurality of elements for generating a first beam and a second beam;

a gateway station in communication with said stratospheric platform, said gateway station receiving a first signal having the first beam having interference from the second beam therein and receiving a second signal having the second beam having interference from the first beam therein,

said gateway station weighing said second signal with a first weight to form a weighted second signal, and thereafter, said gateway station comprising a first subtracting block subtracting said second weighted signal from said first signal to obtain the first beam;

said gateway station weighing said first signal with a second weight to form a first weighted signal, said gateway station comprising a second subtracting block for subtracting said first weighted signal from said second signal to obtain the second beam, said first weight and the second weight being a function of user position files.

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**IX. Evidence Appendix**

None.

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**X. Related Proceedings Appendix**

None.